

## § 23.77

(1) Is safe and reliable; and  
(2) Is used so that consistent results can be expected in service.

(g) If any device is used that depends on the operation of any engine, and the landing distance would be increased when a landing is made with that engine inoperative, the landing distance must be determined with that engine inoperative unless the use of other compensating means will result in a landing distance not more than that with each engine operating.

[Amdt. 23-21, 43 FR 2318, Jan. 16, 1978, as amended by Amdt. 23-34, 52 FR 1828, Jan. 15, 1987; Amdt. 23-42, 56 FR 351, Jan. 3, 1991; Amdt. 23-50, 61 FR 5187, Feb. 9, 1996]

### § 23.77 Balked landing.

(a) Each normal, utility, and acrobatic category reciprocating engine-powered airplane at 6,000 pounds or less maximum weight must be able to maintain a steady gradient of climb at sea level of at least 3.3 percent with—

- (1) Takeoff power on each engine;
- (2) The landing gear extended;
- (3) The wing flaps in the landing position, except that if the flaps may safely be retracted in two seconds or less without loss of altitude and without sudden changes of angle of attack, they may be retracted; and

(4) A climb speed equal to  $V_{REF}$ , as defined in § 23.73(a).

(b) Each normal, utility, and acrobatic category reciprocating engine-powered airplane of more than 6,000 pounds maximum weight and each normal, utility, and acrobatic category turbine engine-powered airplane must be able to maintain a steady gradient of climb of at least 2.5 percent with—

(1) Not more than the power that is available on each engine eight seconds after initiation of movement of the power controls from minimum flight-idle position;

(2) The landing gear extended;

(3) The wing flaps in the landing position; and

(4) A climb speed equal to  $V_{REF}$ , as defined in § 23.73(b).

(c) Each commuter category airplane must be able to maintain a steady gradient of climb of at least 3.2 percent with—

(1) Not more than the power that is available on each engine eight seconds

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after initiation of movement of the power controls from the minimum flight idle position;

(2) Landing gear extended;

(3) Wing flaps in the landing position; and

(4) A climb speed equal to  $V_{REF}$ , as defined in § 23.73(c).

[Doc. No. 27807, 61 FR 5187, Feb. 9, 1996]

### FLIGHT CHARACTERISTICS

#### § 23.141 General.

The airplane must meet the requirements of §§ 23.143 through 23.253 at all practical loading conditions and operating altitudes for which certification has been requested, not exceeding the maximum operating altitude established under § 23.1527, and without requiring exceptional piloting skill, alertness, or strength.

[Doc. No. 26269, 58 FR 42156, Aug. 6, 1993]

### CONTROLLABILITY AND MANEUVERABILITY

#### § 23.143 General.

(a) The airplane must be safely controllable and maneuverable during all flight phases including—

- (1) Takeoff;
- (2) Climb;
- (3) Level flight;
- (4) Descent;
- (5) Go-around; and
- (6) Landing (power on and power off) with the wing flaps extended and retracted.

(b) It must be possible to make a smooth transition from one flight condition to another (including turns and slips) without danger of exceeding the limit load factor, under any probable operating condition (including, for multiengine airplanes, those conditions normally encountered in the sudden failure of any engine).

(c) If marginal conditions exist with regard to required pilot strength, the control forces necessary must be determined by quantitative tests. In no case may the control forces under the conditions specified in paragraphs (a) and (b) of this section exceed those prescribed in the following table: